

Claims

- [c1] A well logging tool, comprising:
a conductive mandrel;
an antenna array disposed around the conductive mandrel, wherein the antenna array comprises a plurality of antennas disposed on insulating supports and at least one contact spacer, the at least one contact spacer having at least one conductor channel having a contact assembly disposed therein; and
a sleeve disposed over the antenna array, wherein the sleeve includes at least one electrode, the at least one electrode and the contact assembly adapted to provide a radially conductive path from an exterior of the well logging tool to the conductive mandrel.
- [c2] 2.The well logging tool of claim 1, wherein the contact assembly comprises a spring adapted to form dynamic contacts with the at least one electrode and the conductive mandrel.
- [c3] 3.The well logging tool of claim 1, wherein the contact assembly comprises a conductor member having spring plates attached to its ends, the spring plates adapted to form dynamic contacts with the at least one electrode

and the conductive mandrel.

- [c4] 4.The well logging tool of claim 3, wherein the spring plates are each disposed in a dove-tailed groove on the contact spacer.
- [c5] 5.The well logging tool of claim 1, wherein the contact assembly comprises a conductor member and the at least one electrode and the conductive mandrel include spring plates adapted to form dynamic contacts with the conductor member.
- [c6] 6.A well logging tool of claim 5, wherein the conductor member is an integral part of the contact spacer.
- [c7] 7.A well logging tool of claim 1, wherein at least one of the plurality of antennas has a transverse magnetic dipole.
- [c8] 8.A well logging tool, comprising:
 - a conductive mandrel;
 - an antenna array disposed around the conductive mandrel, wherein the antenna array comprises a plurality of antennas disposed on insulating supports and at least one contact spacer comprising an electrically anisotropic material; and
 - a sleeve disposed over the antenna array, wherein the sleeve includes at least one electrode, the at least one

electrode and the at least one contact spacer adapted to provide a radially conductive path from an exterior of the well logging tool to the conductive mandrel.

[c9] 9.A well logging tool of claim 8, wherein the at least one electrode and the conductive mandrel include spring plates adapted to form dynamic contacts with the at least one contact spacer.

[c10] 10.A well logging tool of claim 8, wherein the contact spacer includes spring plates adapted to form dynamic contacts with the at least one electrode and the conductive mandrel.

[c11] 11.A well logging tool of claim 8, wherein at least one of the plurality of antennas has a transverse magnetic dipole.

[c12] 12.A method for resistivity logging including reduced borehole current effects using a logging tool disposed in a borehole, wherein the logging tool having an inner conductive mandrel, at least one antenna having a transverse magnetic dipole, and at least one radially conductive path linking the inner conductive mandrel to at least one electrode exposed on a surface of the induction logging tool, wherein the at least one radially conductive path comprising a contact assembly for providing dy-

namic contacts with the inner conductive mandrel and the at least one electrode, the method comprising:
transmitting an electromagnetic energy from a transmitter antenna on the logging tool into a formation;
allowing currents in the borehole to flow through the at least one radially conductive path to the inner conductive mandrel; and
measuring an induced signal in a receiver antenna on the logging tool.